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DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration

[Docket Number: 130809703-3703-01]

RIN 0660-XC007

Spectrum Monitoring Pilot Program

AGENCY: National Telecommunications and Information Administration, U.S. Department of Commerce.

ACTION: Notice of Inquiry.

SUMMARY: In his June 2013 Executive Memorandum on *Expanding America's Leadership in Wireless Innovation*, President Obama directed the National Telecommunications and Information Administration (NTIA) to design and conduct a pilot program to monitor spectrum usage in real time in selected communities throughout the country. NTIA's budget request to Congress for fiscal year (FY) 2014 seeks an initial $7.5 million research and development investment for a two-year pilot program to determine the benefits of an automated spectrum measurement and data collection system to better analyze actual spectrum usage. NTIA issues this Notice of Inquiry (NOI) to seek public comment on this proposed spectrum monitoring pilot program that, if funded, would develop and deploy a prototype system to monitor spectrum usage in up to ten metropolitan areas throughout the United States. The NOI requests input from all interested stakeholders on the measurement system's design, features, deployment options, operational parameters, expected utility, potential benefits, and other issues. Subject to the availability of funds, NTIA will design, develop, validate, and field this prototype system and evaluate whether a more comprehensive monitoring program would create additional

opportunities for more efficient spectrum access through, for example, increased and more dynamic sharing. NTIA intends to use the input received in response to this NOI to help design and implement the spectrum monitoring program.

DATES: Submit comments on or before [insert date 45 days after publication in the Federal Register].

ADDRESSES: The public is invited to submit written comments in paper or electronic form. Written comments may be submitted by email to measurementNOI@ntia.doc.gov. Comments submitted should be machine searchable and should not be copy-protected. Written comments also may be submitted by mail to: National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, HCHB Room 6725, Attn: Ed Drocella, Office of Spectrum Management, Washington, DC 20230. Each commenter should include the name of the person or organization filing the comment as well as a page number on each page of the submission. All comments received will be made a part of the public record in this docket and will be posted to NTIA's website (*http://www.ntia.doc.gov*) without change. All personally identifiable information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Ed Drocella, Office of Spectrum Management, National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue, N.W., HCHB Room 6725, Washington, DC 20230; (202) 482-2608; or *edrocella@ntia.doc.gov*.

SUPPLEMENTARY INFORMATION:

The continued growth in demand for spectrum for commercial wireless services,

unlicensed devices, and government operations – whether at the federal, state, local, tribal, or territorial level – focuses attention on the ability of spectrum policy-makers, researchers, and industry stakeholders to identify relocation or spectrum sharing opportunities and approaches. While clearing spectrum bands of incumbent users to make way for new wireless services has been a viable approach for many years, opportunities to find spectrum to which to relocate federal operations are dwindling rapidly, getting more expensive, and taking longer to implement. Technologies that enable a variety of different networks and users to share the same spectrum bands in the same geographic areas promise greater utilization and efficiency as relocation options become more challenging. However, assessing these opportunities requires better data gathering and analysis techniques which focus on the nature and extent of actual spectrum usage. Spectrum utilization and occupancy measurements offer the possibility to collect data and conduct analysis, which are more reflective of actual use.

The June 2013 Executive Memorandum directs NTIA to design and conduct a pilot program to monitor spectrum usage in real time in selected communities throughout the country.[1] In addition, NTIA's FY 2014 budget request to Congress seeks an initial $7.5 million research and development investment for a two-year pilot program to determine the benefits of an automated spectrum measurement and data collection system to better analyze spectrum usage.[2]

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[1] Memorandum for Heads of Executive Departments and Agencies, *Expanding America's Leadership in Wireless Innovation* (June 14, 2013), 78 Fed. Reg. 37431, 37433 at § 3(c) (June 20, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/14/presidential-memorandum-expanding-americas-leadership-wireless-innovatio (June 2013 Executive Memorandum). The President also directed NTIA to develop a plan that requires applicable federal agencies to make quantitative assessments of the actual usage of spectrum in certain spectrum bands below 6 GHz that have the greatest potential to be shared with nonfederal users. *Id.* at § 3(a). Similarly, the memorandum calls on NTIA to take such actions as are necessary to require that each federal agency's regular reviews of its frequency assignments include a quantitative assessment of its actual usage of spectrum under such assignments. *Id.* at § 3(d).

[2] *See* U.S. Department of Commerce, National Telecommunications and Information Administration, *FY 2014 Budget as Presented to Congress* at 4, 103-108 (April 2013), *available at* http://www.osec.doc.gov/bmi/budget/FY14CJ/NTIA_FY_2014_CJ_Final_508_Compliant.pdf.

Under the proposal in the budget request, NTIA would design, develop, validate, and field a prototype spectrum monitoring system. The input submitted in response to this NOI will be used by NTIA to help design the pilot program, if funded.

NTIA is considering that the initial system for the pilot program include a small network of radiofrequency sensors installed at selected sites in up to ten major metropolitan areas to collect data across particular bands of interest. The measurement equipment would automatically feed data to a centralized database for storing, retrieving, and analyzing spectrum usage and occupancy information. Spectrum policy-makers, researchers, and other stakeholders would have access to the data and analysis to corroborate other quantitative assessments and investigate the feasibility of supporting new and innovative spectrum access capabilities, such as more dynamic spectrum sharing approaches in key federal or non-federal bands. If the pilot phase successfully demonstrates the value of this monitoring capability, NTIA would look to promote more widespread deployment.

NTIA's Office of Spectrum Management (OSM) and the Institute for Telecommunication Science (ITS) in Boulder, Colorado, will design and conduct the pilot program in collaboration with other federal and non-federal spectrum stakeholders and researchers. In accordance with the June 2013 Executive Memorandum, NTIA will also consult with each federal agency to determine the correct technical parameters to monitor usage and to ensure that the program will not reveal sensitive or classified information. Based on the input received from the agencies and in response to this NOI, as well as NTIA's spectrum management objectives and other relevant factors, OSM would identify metropolitan areas and coverage criteria, monitoring requirements, and measurement parameters.

The system would be designed and intended to interoperate with other third-party

measurement units and spectrum databases to enable academic and industry researchers, commercial and government spectrum managers, and independent database managers to implement and deploy their own data collection and dissemination systems. To encourage and facilitate similar, interoperable measurement efforts throughout the country, NTIA would make available to these interested parties criteria, requirements, parameters, designs, interfaces, software, data sets, and other information generated at each phase of the project.

The prototype monitoring unit would be designed to run continuously at remote sites with system control and data uploads performed over the Internet. Standardized data sets would be accumulated and analyzed within the unit and uploaded to a centralized database. Based on the fully developed and tested prototype unit and subject to available funds, ten or more identical spectrum measurement units would be built and deployed in up to ten major metropolitan areas throughout the United States. Once deployed, they would continuously monitor the spectrum and collect data in pre-determined frequency bands and upload them to the database.

If successful, this initiative will present a number of benefits for NTIA, other federal agencies, academia, and industry. For example, by improving the reliability of agency-reported spectrum usage data, NTIA and other interested parties could verify other quantitative usage assessments, evaluate the potential for more relocation and sharing opportunities, assess the feasibility of dynamic frequency access approaches in particular bands, and conduct research into other spectrum access and management methods. Federal agencies could use the spectrum usage data to support regular frequency assignment reviews and to identify and characterize incumbent systems in bands available for sharing and assess the impact of sharing on their missions. The measurement data could also assist the agencies in determining the technical and operational feasibility of relocating to other bands. Industry stakeholders could use the data to

assess the feasibility of spectrum sharing by evaluating spectrum availability and developing commercially viable spectrum sharing technologies and approaches.

At the conclusion of the initial two-year pilot phase, NTIA would seek additional input from the spectrum community and assess whether to recommend the continuation and expansion of the spectrum measurement program in collaboration with the new Center for Advanced Communications in Boulder, Colorado.[3] NTIA will evaluate the benefits demonstrated by the pilot, the ability to support spectrum decision-making, and will determine whether the concept can and should be expanded to include other sites, bands, and participants.

Request for Comments

NTIA requests public comment on all aspects of the proposed pilot program summarized above and its FY14 budget request, including but not limited to the measurement system's design, features, deployment, operation, utility, and benefits. NTIA also seeks input on the pilot program's objectives and approach, as well as methods for evaluating the pilot program itself. NTIA seeks input on other possible approaches to developing and fielding such a system along with their estimated costs, potential impediments, and likely advantages.

NTIA solicits information regarding how academic, government and private sector researchers may participate in and support the pilot program through, for example, exchanges of experiences and expert advice, workshops, plug-fests, code-a-thons, or other events. NTIA further seeks comment on how researchers can assist and participate in the continuation and

[3] NTIA and the National Institute for Standards and Technology (NIST) recently announced a cooperative effort launch the Center for Advanced Communications to address current and long-term communications technology challenges related to spectrum sharing, public safety communications, standards coordination, electromagnetics, and quantum electronics. *See* Press Release, *NIST and NTIA Announce Plans to Establish New Center for Advanced Communications* (June 14, 2013), *available at* http://www.nist.gov/public_affairs/releases/nist-ntia-mou-061413.cfm.

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expansion of the system into a wide-spread network of spectrum measurement facilities and cooperative data repositories.

More specifically, NTIA invites comment on the following questions:

1. How should a measurement system be designed to measure a variety of emissions, including weak or intermittent signals, airborne platforms, and radar systems, while keeping incremental costs in check?
2. What types of measurement/monitoring techniques should be used for the different types of radio services?
3. What frequency bands should initially be measured during the pilot phase of the program?
4. How should measurement and monitoring parameters (*e.g.*, resolution and video bandwidths, sampling rate, dwell time, detector selection, antennas, pre-selector filtering, dynamic range) be specified?
5. Which geographic locations within major metropolitan areas or other communities throughout the country would provide the greatest value for the pilot?
6. How should individual measurement units be deployed in each community?
7. How could the long- or short-term placement of multiple fixed units within the same general geographic area improve the accuracy and reliability of the data collected in each community and at what incremental cost?
8. How could mobile or portable units be utilized to supplement data collected at fixed sites within a community and at what incremental cost?
9. How long should measurement data be collected to provide statistically relevant results, particularly for intermittent operations, at each geographic location?

10. How should the measurement system design take into account variations in population densities, buildings, terrain and other factors within or surrounding selected measurement locations (*i.e.*, in urban, suburban, and rural parts of a metropolitan area)?
11. What steps can be taken to eliminate or minimize the possibility of "hidden nodes" when conducting measurements?
12. What kind of spectrum utilization and occupancy information (*e.g.*, precise received field strength levels, time-of-day occupancy percentages, times that signals are measured above specified thresholds) would be most useful to spectrum stakeholders?
13. What detection thresholds should be used to measure and characterize the usage patterns of incumbent systems?
14. What data and information would be useful in evaluating potential sharing compatibility with wireless broadband devices?
15. How can the gathered data and analysis better inform spectrum policy decisions, enhance research and development of advanced wireless technologies and services?
16. What data formats and evaluation tools should be employed?
17. How can the large amounts of measurement data be effectively managed, stored, and distributed?
18. What steps can be taken to ensure that sensitive or classified information will not be revealed to unauthorized parties?

Dated: August 14, 2013.

Karl B. Nebbia,

Associate Administrator, Office of Spectrum Management.

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